

WHAT IS CLAIMED IS:

1. A method comprising:
storing data objects as nodes in a directed graph; and
storing path information for a first object corresponding to a first node, where the
5 path information provides relational information about a direct path through the directed
graph between the first node and a second node, where the second node is separated from the
first node along the direct path by at least a third node.
2. The method of claim 1 further comprising:
10 accepting a query regarding the first node;
locating the first object; and
accessing the path information to respond to the query.
3. The method of claim 1 wherein storing data objects comprises:
15 storing each data object in a first column of a data table; and
storing a relation of the first data object to a consecutive data object in a second field
of the data table, where the consecutive data object is connected to the first data object in the
directed graph by a single edge.
- 20 4. The method of claim 3 wherein storing path information comprises storing the
path information in a third field of the data table.
5. The method of claim 1 wherein storing path information comprises storing a
data string as the path information, where the data string includes at least the second node
25 and the third node.
6. The method of claim 5 comprising comparing the data string to a query
regarding the first node, in order to respond to the query.

7. The method of claim 5 wherein storing the data string comprises:
determining a first direct path through the directed graph of which the first node is a
part;
5 determining a first data string based on the first direct path;
determining a second direct path through the directed graph of which the first node is
a part;
determining a second data string based on the second direct path; and
concatenating the first data string and the second data string for storing as the path
10 information.

8. The method of claim 1 wherein storing path information comprises
transforming the relational information into a coded value.

15 9. The method of claim 1 wherein the directed graph includes a hierarchical,
multi-leveled data structure.

10 10. The method of claim 1 wherein storing path information comprises updating
the path information to reflect changes in the directed graph.

20 11. An apparatus comprising a storage medium having instructions stored thereon,
the instructions including:

a first code segment for storing data objects within a table;
a second code segment for storing a relation of a first data object to a second data
25 object in the table, where the first data object and the second data object correspond to
consecutive nodes on a directed graph; and
a third code segment for storing path information associated with the first data object
in the table, where the path information describes a path within the directed graph that is
between the first node, the second node, and a third node.

12. The apparatus of claim 11 further comprising:

a fourth code segment for accepting a query about the first node and a possible relation of the first node to another node within the directed graph; and

5 a fifth code segment for responding to the query based on the path information.

13. The apparatus of claim 12 wherein the fifth code segment includes a sixth code segment for detecting the first data object within the table and comparing the path information to the query.

10

14. The apparatus of claim 11 wherein the first data object, the second data object, and the path information are stored in separate columns of a single row of the table.

15. The apparatus of claim 11 wherein the third code segment stores the path information as a data string listing the second node and the third node.

15

16. The apparatus of claim 11 wherein the third code segment stores the path information as a coded value generated from information about the second and third node and their locations within the directed graph.

20

17. A system comprising:

means for accessing path information that describes a path through a directed graph between a first node and a plurality of other nodes; and

means for responding to a query involving the first node, based on the path information.

25

18. The system of claim 17 wherein the means for accessing path information comprises means for storing the path information or a reference to the path information in a table containing a first data object corresponding to the first node.

30

19. The system of claim 17 wherein the means for responding to the query comprises means for directly locating the first data object within the table in response to the query.

5 20. The system of claim 19 wherein the means for responding to the query comprises means for performing a pattern match between the query and a data string listing the path through the directed graph.